ELSEVIER

Journal of Non-Crystalline Solids 186 (1995) ix–xii

JOURNAL OF NON-CRYSTALLINE SOLIDS

Contents

Preface vii
Contents ix

Section 1. Aerogel synthesis

Physical properties of silica gels and aerogels prepared with new polymeric precursors
G.M. Pajonk, E. Elaloui, P. Achard, B. Chevalier, J.-L. Chevalier and M. Durant 1

Relations between the texture of silica aerogels and their preparation
F. Ehrburger-Dolle, J. Dallamano, E. Elaloui and G.M. Pajonk 9

Low-density, hydrophobic aerogels
K.-H. Lee, S.-Y. Kim and K.-P. Yoo 18

Hydrophobic silica aerogels
H. Yokogawa and M. Yokoyama 23

Fine low density silica powders prepared by supercritical drying of gels derived from silicon tetrachloride
J.R. Heley, D. Jackson and P.F. James 30

Influence of supercritical drying fluid on structure and properties of organically modified silica aerogels
N. Hüsing, F. Schwertfeger, W. Tappert and U. Schubert 37

Alkylene-bridged polysilsesquioxane aerogels: highly porous hybrid organic–inorganic materials
D.A. Loy, G.M. Jamison, B.M. Baugher, E.M. Russick, R.A. Assink, S. Prabakar and K.J. Shea 44

Effects of aging and drying on structure of V_2O_5 gels
H. Hirashima, M. Gengyo, C. Kojima and H. Imai 54

Preparation and characterization of lead titanate aerogels
P. Löbmann, W. Glaubitt, J. Gross and J. Fricke 59

Section 2. Drying methodologies and sintering

Ultraporous materials with low permeability
J. Phalippou, G.W. Scherer, T. Woignier, D. Bourret and R. Sempéré 64

Diffusion of ethanol–liquid CO_2 in silica aerogel
G. Rogacki and P. Wawrzyniak 73

Drying of silica aerogel with supercritical carbon dioxide
M.J. van Bommel and A.B. de Haan 78

Effects of supercritical drying media on structure and properties of silica aerogel
K. Tajiri, K. Igarashi and T. Nishio 83

Effect of supercritical drying temperature on the properties of zirconia, niobia and titania–silica aerogels
C.J. Brodsky and E.I. Ko 88

Preparation and properties of monolithic silica xerogels from TEOS-based alcogels aged in silane solutions
S. Hæreid, M. Dahle, S. Lima and M.-A. Einarsrud 96
Preparation of low-density xerogels at ambient pressure
D.M. Smith, D. Stein, J.M. Anderson and W. Ackerman 104
Sintering behaviour of alumina-modified silica aerogels
R. Saliger, T. Heinrich, T. Gleissner and J. Fricke 113

Section 3. Aerogel characterization

A. Scattering measurements

Small-angle neutron scattering of aerogels: simulations and experiments
A. Hasmy, M. Foret, E. Anglaret, J. Pelous, R. Vacher and R. Jullien 118
Fracton dimension of a mutually self-similar series of base-catalyzed aerogels
E. Anglaret, A. Hasmy, E. Courtens, J. Pelous and R. Vacher 131
Structural changes and elastic properties in aerogels investigated by Brillouin scattering
E. Anglaret, J. Pelous and L.H. Hrubesh 137
Structural analysis of silica aerogels
D.W. Hua, J. Anderson, J. Di Gregorio, D.M. Smith and G. Beaucage 142
Structural characterization of SiO_2–Al_2O_3 aerogels
B. Himmel, Th. Gerber, H. Bürger, G. Holzhüter and A. Olbertz 149
Origin of porosity in resorcinol–formaldehyde aerogels
D.W. Schaefer, R. Pekala and G. Beaucage 159

B. Other methods

Local, nano- and micro-structures of mixed metal oxide aerogels for catalyst applications
L.M. Hair, L. Owens, T. Tillotson, M. Fröba, J. Wong, G.J. Thomas and D.L. Medlin 168
Characterization of vanadium/silica and copper/silica aerogel catalysts
L. Owens, T.M. Tillotson and L.M. Hair 177
Structural investigations of pyrolyzed organically modified SiO_2 aerogels
J. Kuhn, F. Schwertfeger, M.C. Arduini-Schuster, J. Fricke and U. Schubert 184
Surface and near-surface structure in carbon microcellular materials produced from organic aerogels and xerogels
Wm.R. Even, R.W. Crocker, M.C. Hunter, N.C. Yang and T.J. Headley 191
Relationship between particle size and magnetoresistance in carbon aerogels prepared under different catalyst conditions
A.W.P. Fung, G.A.M. Reynolds, Z.H. Wang, M.S. Dresselhaus, G. Dresselhaus and R.W. Pekala . . . 200
High resolution transmission electron microscopy nanostructure of condensed-silica aerogels
G.C. Ruben, L.W. Hrubesh and T.M. Tillotson 209
High-resolution transmission electron microscopy of the nanostructure of melamine–formaldehyde aerogels
G.C. Ruben and R.W. Pekala 219

Section 4. Structure–property relationships

A. Optical and acoustic

Radiation transport and image transmission through aerogels
A. Beck, J. Linsmeier, W. Körner, H. Scheller and J. Fricke 232
Constant-Q acoustic attenuation in silica aerogels
A. Zimmermann, J. Gross and J. Fricke 238

Acoustic properties and potential applications of silica aerogels
V. Gibiat, O. Lefeuvre, T. Woignier, J. Pelous and J. Phalippou 244

B. Thermal

IR emission spectroscopy of silica aerogel
R. Stangl, W. Platzer and V. Wittwer 256

Transport properties of gas in silica aerogel
S.Q. Zeng, A. Hunt and R. Greif 264

Theoretical modeling of carbon content to minimize heat transfer in silica aerogel
S.Q. Zeng, A. Hunt and R. Greif 271

Thermal conductivity of silica aerogel powders at temperatures from 10 to 275 K
Th. Rettelbach, J. Säuberlich, S. Korder and J. Fricke 278

Thermal characterization of carbon-opacified silica aerogels
D. Lee, P.C. Stevens, S.Q. Zeng and A.J. Hunt 285

Integration of mineral powders into SiO_2 aerogels
J. Kuhn, T. Gleissner, M.C. Arduini-Schuster, S. Korder and J. Fricke 291

Monolithic silica aerogel insulation doped with TiO_2 powder and ceramic fibers
J. Wang, J. Kuhn and X. Lu 296

Thermal expansion of carbon and silica aerogels above room temperature
J. Gross and J. Fricke 301

C. Mechanical

Deformation of aerogels during characterization
G.W. Scherer, D.M. Smith and D. Stein 309

Compression of aerogels
G.W. Scherer, D.M. Smith, X. Qiu and J.M. Anderson 316

Plastic behaviour of aerogels under isostatic pressure
L. Duffours, T. Woignier and J. Phalippou 321

D. Gas permeability

Gas permeability of partially densified aerogels
I. Beurroies, D. Bourret, R. Sempéré, L. Duffours and J. Phalippou 328

Characterization of SiO_2, RF and carbon aerogels by dynamic gas expansion
G. Reichenauer, C. Stumpf and J. Fricke 334

Section 5. Modeling

Sol–gel process simulation by cluster–cluster aggregation
A. Hasmy and R. Jullien 342

Molecular dynamics computer simulations of silica aerogels
P.I. Pohl, J.-L. Faulon and D.M. Smith 349

Realistic computer models of aerogels
E.A. Chandler and D.F. Calef 356

Numerical study of phase transitions inside the pores of aerogels
K. Uzelac, A. Hasmy and R. Jullien 365

Section 6. Commercialization and applications

Aerogel commercialization: technology, markets and costs
G. Carlson, D. Lewis, K. McKinley, J. Richardson and T. Tillotson 372

On the way to commercial production of silica aerogel
G. Herrmann, R. Iden, M. Mielke, F. Teich and B. Ziegler 380

Fluorescent dye doped aerogels for the enhancement of Čerenkov light detection
M. Bockhorst, K. Heinloth, G.M. Pajonk, R. Begag and E. Elaloui 388
Solidification of aluminium alloys in aerogel moulds
J. Alkemper, T. Buchholz, K. Murakami and L. Ratke 395
Aerogel materials for photocatalytic detoxification of cyanide wastes in water
M.S. Ahmed and Y.A. Attia 402
Vanadium–titanium oxide aerogel catalysts
R.J. Willey, C.-T. Wang and J.B. Peri 408
Silica aerogel captures cosmic dust intact
P. Tsou 415

Author index 429
Subject index 433